

POST GRADUATE PROGRAMME – M.Sc. COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM (CBCS PATTERN)

(FOR THE CANDIDATES ADMITTED FROM THE ACADEMIC YEAR 2023 - 24 ONWARDS)

SEMESTER & (PART)	COURSE CODE	TITLE OF THE COURSE	NATURE	IH	CP	EXAM HOURS	EXAM MARKS		
							CIA	ESE	TOTAL
I SEMESTER	23PCS1C01	CORE : PRINCIPLES OF COMPILER DESIGN	CC	5	4	3	25	75	100
	23PCS1C02	CORE : ANALYSIS AND DESIGN OF ALGORITHMS	CC	5	4	3	25	75	100
	23PCS1C03	CORE : ADVANCED JAVA PROGRAMMING (Employability)	CC	5	4	3	25	75	100
	23PCS1E01 / 23PCS1E02	ELECTIVE : PARALLEL PROCESSING/ NEURAL NETWORKS AND GENETICS ALGORITHM (Skill Development)	DSE	5	5	3	25	75	100
	23PCS1CP1	CORE PRACTICAL : ADVANCED JAVA PROGRAMMING (Employability)	CC	5	4	3	25	75	100
	23PCS1CP2	CORE PRACTICAL : ANALYSIS AND DESIGN OF ALGORITHMS	CC	5	4	3	25	75	100
II SEMESTER	23PCS2C04	CORE:DATA COMMUNICATION AND NETWORKS (Skill Development)	CC	5	4	3	25	75	100
	23PCS2C05	CORE : ADVANCED OPERATING SYSTEMS (Skill Development)	CC	5	4	3	25	75	100

	23PCS2C06	CORE : ADVANCED PYTHON PROGRAMMING (Employability)	CC	5	4	3	25	75	100
	23PCS2E01/ 23PCS2E02	ELECTIVE : MACHINE LEARNING / SOFT COMPUTING (Employability)	DSE	5	5	3	25	75	100
	23PCS2CP3	CORE PRACTICAL : ADVANCED PYTHON PROGRAMMING (Employability)	DSE	5	4	3	25	75	100
	23PCS2CP4	CORE PRACTICAL : LINUX PROGRAMMING (Employability)	CC	5	4	3	25	75	100
III SEMESTER	23PCS3C07	CORE: DIGITAL IMAGE PROCESSING (Employability)	CC	5	4	3	25	75	100
	23PCS3C08	CORE : DATA MINING WITH R (Employability)	CC	5	4	3	25	75	100
	23PCS3C09	CORE : SOFTWARE PROJECT MANAGEMENT (Entrepreneurship)	CC	5	4	3	25	75	100
	23PCS3E01 / 23PCS3E02	ELECTIVE : ARTIFICIAL INTELLIGENCE/ E – TECHNOLOGIES (Skill Development)	DSE	5	5	3	25	75	100
	23PCS3CP5	CORE PRACTICAL : PROGRAMMING WITH R (Employability)	CC	5	4	3	25	75	100
	23PCS3CP6	CORE PRACTICAL : DIGITAL IMAGE PROCESSING (Employability)	CC	5	4	3	25	75	100
IV SEMESTER	23PCS4C10	CORE : BIG DATA ANALYTICS (Employability)	CC	5	4	3	25	75	100
	23PCS4C11	CORE : CLOUD COMPUTING (Entrepreneurship)	CC	5	4	3	25	75	100
	23PCS4PVV	PROJECT AND VIVAVOCE	CC	20	7	3	100	100	200

TOTAL					90				2200
		DIGITAL SECURITY		2	2	3	-	50	50
		Swayam & MOOC Course		-	2	-	-	-	-
GRAND TOTAL		TOTAL		120+ 2	90 + 2 + 2	--	--	--	2250

IH –Instructional Hours, CP-Credit Points ,CIA -Continuous Internal assessment ESE-End Semester Examination

ABBREVIATIONS	NATURE OF COURSE
CC	CORE
DSE	DISCIPLINE SPECIFIC ELECTIVE

SEMESTER: I

COURSE CODE: 23PCS1C01

TITLE OF THE COURSE : CORE : PRINCIPLES OF COMPILER DESIGN

COURSE OBJECTIVES:

- To inculcate the major concept areas of language translation and compiler design
- To enrich the knowledge in various phases of compiler and its use, code optimization techniques, machine code generation and use of symbol table.
- To extend the knowledge of parser by parsing LL parser and LR parser.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Intercept the knowledge of compilers and its phases	K2
CO2	Infer the concept of syntax analysis, Categorize parsing techniques and construct syntax tree	K2
CO3	Interpret the intermediate code generation languages and statements	K2

CO4	Illustrate issues in generating code and Construct target machine and DAG of basic blocks	K2
CO5	Implement the code optimization techniques on basic blocks.	K6

Credits -4

SYLLABUS

Instructional Hours: 75

UNIT – I: Components in Environments of Compilers (K2)

15 hours

Introduction to Compilers - Phases of a Compiler - Cousins of the Compiler - Grouping of Phases – Compiler Construction tools - Role of Lexical Analyzer.

(Self Study: Cousins of the Compilers)

UNIT – II: Parsing methods in Translation of languages (K2)

15 hours

Role of the Parser – Writing Grammars - Context Free Grammar -Recursive percent parsing – Predictive Parsing - Shift Reduce Parsing - Syntax Directed Definition - Construction of Syntax Trees – Bottom up Evaluation of S-attribute Definitions.

UNIT – III: Syntax Directed Methods for code generation (K2)

15 hours

Intermediate Languages- Declarations – Assignment Statements - Boolean Expressions – Case Statements.

(Self Study: Declarations)

UNIT – IV: Transformation of code (K2)

15 hours

Issues in the design of Code generator – The Target Machine - Basic Blocks & Flow Graphs – A Simple code Generator - DAG Representation of basic blocks – Peephole Optimization.

(Beyond the Curriculum: Control-flow and Data-flow Analysis)

UNIT – V: Optimizing techniques in Allocation of data objects (K6)

15 hours

Introduction – Principal Sources of Optimization – Optimization of Basic Blocks. Source Language Issues – Storage Organization, Symbol tables.

TEXT BOOK

1. Alfred V. Aho., Ravi Sethi., Jeffrey D. Ullman.(2007).Compilers: Principles, Techniques, &Tools.(2nd Edition).Pearson Education , London .

REFERENCE BOOKS

1. Allen J Holub.(2003) .Compiler Design in C. Prentice Hall of India , New Delhi .
2. Fischer. C. N., LeBlanc. R. J.(2003).Crafting a Compiler with C. Benjamin Cummings .St. Francisco

3. Bennett. J.P.(2003) .Introduction to Compiling Techniques.(2nd Edition).Tata McGraw-Hill , Uttar Pradesh.
4. Henk Alblas., Albert Nymeyer.(2001).Practice and Principles of Compiler Building with C. Prentice Hall , New Delhi.
5. Kenneth C. Louden.(2003).Compiler Construction: Principles and Practice. Thompson Learning , Boston.

BLENDDED LEARNING

UNIT	TOPICS	LINKS
V	Principal Sources of Optimization	https://youtu.be/HepbfqFqQEs
V	Optimization of Basic Blocks	https://youtu.be/Uk9wnZvyd6Q
V	Source Language Issues	https://youtu.be/QY74HBde-kU
V	Storage Organization	https://youtu.be/9RFuwSH4zIM
V	Symbol Table	https://youtu.be/yJmwYwgqIGU

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3	2	1	3	3	3	3	3	3	3	2	1	3
CO2	2	1	3	2	1	3	1	1	3	3	3	3	3	3
CO3	1	2	1	3	3	3	3	3	3	3	3	1	1	2
CO4	3	2	2	1	1	2	3	3	1	1	3	1	2	2
CO5	3	3	3	3	3	3	3	3	2	1	3	2	1	3

(Correlation: 3-High, 2-Medium, 1-Low)

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment

1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Model Exam	Once in a Semester
5	Assignment(Unit I & II)	Twice in a Semester
6	Seminar (Unit III & IV)	Twice in a Semester
7	Online Quiz	Once in a Semester

Course designed by:Ms.R.Uma Maheswari	Verified by HOD:Ms.R.UmaMaheswari
Checked by CDC:Dr.Jaculin Arockia Selvi.S	Approved by : Principal

SEMESTER : I

COURSE CODE : 23PCS1C02

TITLE OF THE COURSE : CORE: ANALYSIS AND DESIGN OF ALGORITHMS

COURSE OBJECTIVES:

- To understand the fundamental concepts of design and analysis techniques of algorithmswith act on data structures.
- To discuss various algorithm design strategies with proper illustrative examples.
- To enhance problem solving methods.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Discuss about the design and analysis of algorithms using data structures techniques.	K2
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CO2	Explain divide and conquer methods and synthesize greedy algorithms.	K2
CO3	Describe the various terminologies of graphs and trees, use them for various applications.	K1
CO4	Illustrate the problem solving techniques with backtracking methods.	K2
CO5	Compare the branch and bound design paradigm to solve the problems.	K2

Credits - 4

SYLLABUS

Instructional hours- 75

UNIT - I: Problem solving and Algorithmic Analysis (K2)

15 hours

Algorithm definition and specification – performance analysis – Stacks and queues – trees – dictionaries – priority queues – sets and disjoint set union – graphs – basic traversal and search techniques.

(Self Study :Trees)

UNIT – II :Greedy Algorithmic Strategies (K2)

15 hours

Divide and conquer- General method – binary search – merge sort – quick sort – The Greedy method- General method – knapsack problem – minimum cost spanning tree – single source shortest path.

UNIT - III :Dynamic Programming Algorithmic Strategies (K1)

15 hours

Dynamic Programming - general method – multistage graphs – all pair shortest path – optimal binary search trees – 0/1 Knapsack – traveling salesman problem – flow shop scheduling.

(Self Study :0/1 Knapsack)

UNIT – IV :Backtracking (K2)

15 hours

General method – 8-Queens problem – sum of subsets – graph coloring – Hamiltonian cycles – knapsack problem.

(Beyond the Curriculum:Knight-Tour Problem)

UNIT - V :Branch and bound (K2)

15 hours

The method – 0/1 Knapsack problem – traveling salesperson – Efficiency Consideration.

TEXT BOOK

1. Ellis Horowitz., Sartaj Sahni., SanguthevarRajasekaran ,(2008), Computer Algorithms, (2ndEdition) .Galgotia Publications , Delhi.

REFERENCE BOOKS

1. Alfred V.Aho., John E.Hopcroft., Jeffrey D.Ullman , (2009) , Data Structures and Algorithms. (4th edition) .Pearson Education , London.
2. AnanyLevitin , (2012) , Introduction to the design and Analysis of Algorithms , (3rd Edition) Pearson Education , London
3. Robert Lafore , (2003) , Data Structures & Algorithms in Java. (2nd Edition).Sams Publishing , Chennai
4. Thomas H Cormen.,Charles E Leiserson., Ronald L.Rivest.,Clifford Stein.(2009). Introduction to algorithms.(3rd Edition) .Library of Congress Cataloging publication , USA.

BLENDED LEARNING

UNIT	TOPICS	LI N KS
V	The Method	http://youtu.be/JxmwHAGcuxk
V	0/1 Knapsack problem	http://yputu.be/nLmhmb6NzcM
V	Traveling salesperson	http://youtu.be/XaXsJJh-Q5Y
V	Efficiency Considerations	http://www.tutorialspoint.com/design_and_analysis_of_algorithms/analysis_of_algorithms.htm

MAPPING OF CO'S WITH Pos AND PEOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2	1	3	2	1	3	3	3	3	3	3	1

CO2	3	3	3	3	3	2	1	1	2	3	1	2	3	2
CO3	2	3	2	1	1	2	2	1	2	3	3	3	3	3
CO4	1	3	3	3	1	2	1	3	3	3	3	2	1	2
CO5	2	1	1	1	3	3	3	3	1	1	3	3	3	1

(Correlation: 3-High, 2-Medium, 1-Low)

ASSESSMENT TOOLS:

S.No	Assessment Methods	Frequency of Assessment
1.	End Semester Examination	Once in a Semester
2.	CIA I	Once in a Semester
3.	CIA II	Once in a Semester
4.	Model Exam	Once in a Semester
5.	Assignment (Unit I and Unit II)	Twice in a Semester
6.	Seminar (Unit III and Unit VI)	Twice in a semester
7.	Case Studies Presentation (Unit V)	Once in a Semester

Course designed by: Ms.C.Clement Sherlin	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER I

COURSE CODE : 23PCS1C03

TITLE OF THE COURSE: CORE: ADVANCED JAVA PROGRAMMING

COURSE OBJECTIVES:

- To inculcate the domain knowledge of advanced programming using Java Swing, RMI and Servlets with real time examples.
- To formulate the student's ability in implementing case studies using Java technologies.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Discuss the fundamentals concepts of classes and objects, Inheritance, package , Interface and exception handling	K2
CO2	Implement problems using threads and collections	K3
CO3	Design swing based GUI applications with JDBC	K6
CO4	Apply different Java technologies to solve internet applications	K3
CO5	Develop distributed applications using RMI and Servlets.	K5

Credits-4

SYLLABUS

Instructional Hours-

75UNIT – I: Overview Of Java (K2)

15

hours

Methods and classes – Inheritance– Exception Handling - Packages and Interfaces.

(Self Study: Packages and Interfaces)

UNIT – II: Multithreaded and Collections Programming (K3)

15 hours

Multithreaded programming - The Collection Interfaces – Collection – List – Set – SortedSet- The Collection Classes – ArrayList – LinkedList- -HashSet –TreeSet- Accessing a Collection using Iterator – Arrays.

(Beyond the Curriculum: Hash Map)

UNIT - III: GUI Programming With Swing, JDBC (K6)**15**

hoursCreating a swing application- JLabel- JText Field – Swing Buttons – JCombo Box–JList - JMenuBar – JMenu –JMenuItem .Components of JDBC – JDBC Basics – Prepared statement - Creating table - Dropping Table – Steps for Using JDBC – Creating Statement

– Executing DDL and DML commands – Joins and Transactions-JDBC -Accessing database using JDBC – Introduction-JDBC driver -architecture-Classes – Interfaces.

UNIT - IV :Networking, JSP, Java Bean (K3)**15**

hoursNetworking basics- Inset address - TCP/IP client sockets -URL- URL connection- TCP/IP server sockets- Datagram Application- JSP architecture- life cycle of JSP- JSP tags & expressions – JSP application - JavaBeans.

(Self Study:Java Beans).

UNIT – V :-Servlets and Remote Method Invocation (K5)**15 hours**

The Life Cycle of a Servlets - A Simple Servlets - The Servlets API – The javax.servlet Package - Reading Servlets Parameters – The javax.servlet - http Package - Handling HTTP Requests and Responses- Using Cookies - Session Tracking. Java.sql Package

TEXT BOOKS

1. Herbert Schildt. (2014). JAVA - The Complete Reference. (9th Edition).McGraw Hill Education Publication , New York.
2. Rashmi Kanta Das , (2009) , Core Java for Beginners. (3rd Edition). Vikas Publications , New Delhi.

REFERENCE BOOKS

1. Herbert Schildt.(2010), JAVA - The Complete Reference. (7thEdition).McGraw Hill Education Publication , New York.
2. Herbert Schildt. (2002) ,JAVA 2 - The Complete Reference. (5thEdition). McGraw Hill Education Publication. New York.
3. Karl Moss, (2011), Java Servlets.(5threprint). Tata McGraw-Hill Publication , Uttar

Pradesh.

4. M.Ibrahim. (2006) , Java :J2SE 5. (1st Edition). Firewall Media. New Delhi
5. Jim Keogh.(2002) , The Complete Reference J2EE. Tata McGraw –Hill Publication ,
Uttar Pradesh.

BLENDDED LEARNING

UNIT	TOPICS	LINKS
V	The lifecycle of a Servlets	http://youtu.be/SpOWu3NHFIw
V	A Simple Servlets	http://youtu.be/nHAB3r8tdVI
V	The Servlets API	http://youtu.be/8CYHG8D51r0
V	The javax.servlet Package	http://youtu.be/ji52W1iXgrs
V	Reading Servlets Parameters	http://youtu.be/iF30_UIxVgI
V	The javax.servlet	http://youtu.be/F180ixZNd-A

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	1	3	3	3	3	3	1	3	2	3
CO2	3	2	3	3	1	3	1	2	2	2	1	3	3	3
CO3	3	3	2	3	1	3	1	3	3	3	1	3	3	3
CO4	3	3	2	3	1	3	1	2	3	3	3	3	2	3
CO5	3	3	2	3	1	3	1	3	3	3	1	3	2	3

(Correlation: 3-High, 2-Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester

3	CIA II	Once in a semester
4	Model Exam	Once in a semester
5	Assignment(Unit I and Unit II)	Twice in a semester
6	Seminar(Unit III and Unit IV)	Twice in a semester
7	Case Studies (Unit V)	Once in a semester

Course designed by: Ms.R.Ushadevi	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin ArockiaSelvi.S	Approved by Principal

SEMESTER : I

COURSE CODE:

23PCS1E01

TITLE OF THE COURSE : ELECTIVE:PARALLEL PROCESSING

(SKILL DEVELOPMENT)

COURSE OBJECTIVES:

- To inculcate the students to understand the basic concepts of architecture by solving problems in parallel and SIMD processors.
- To have a knowledge about interconnection networks and to differentiate the types of matrix operations.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Infer the basic knowledge of parallel processing and different classification schemes.	K2
CO2	Implement the ability of temporal ,data parallel processing to solve pipeline problems.	K3

CO3	Illustrate the essentials of linear pipelining, data buffering and busing structures.	K2
CO4	Examine the concept of SIMD and types of network.	K4
CO5	Create the ability to develop parallel algorithms with matrix operations	K6

Credits–5

SYLLABUS

Instructional hours – 75

UNIT-I: Introduction to parallel processing (K2)

15 hours

Introduction to parallel processing – Trends towards parallel processing – Parallelism in uniprocessor Systems – Parallel Computer structures – Architectural Classification schemes – Flynn’s Classification – Feng’s Classification – Handler’s Classification – Parallel Processing Applications

UNIT – II: Solving problems in parallel (K3)

15 hours

Solving Problems in Parallel: Utilizing Temporal Parallelism – Utilizing Data Parallelism – Comparison of Temporal and Data Parallel Processing – Data parallel processing with specialized Processor – Inter-task Dependency. Instructional Level Parallel Processing – Pipelining of Processing Elements – Delays in Pipeline Execution – Difficulties in Pipelining.

(Self Study : Comparison of temporal and data parallel processing)

UNIT - III: Principles Linear Pipelining

(K2)

15 hours Principles Linear Pipelining – Classification of Pipeline Processors – General Pipeline and Reservation tables – Arithmetic Pipeline – Design Examples – Data Buffering and Busing structure – Internal forwarding and Register Tagging – Hazard Detection and Resolution – Job sequencing and Collision prevention – Vector processing requirements – Characteristics – Pipelined Vector Processing methods

UNIT- IV: SIMD Array Processors (K4)

15 hours

SIMD Array Processors – Organization – Masking and Data routing — SIMD Interconnection Networks – Static Vs Dynamic – Mesh connected Illiac – Cube interconnection network – Shuffle-Exchange and Omega networks - Multiprocessor Architecture and programming Functional structures – interconnection Networks.

UNIT – V: Parallel Algorithms (K6)

15 hours

Parallel Algorithms: Models of computation – Analysis of Parallel Algorithms Prefix Computation – Sorting – Searching – Matrix Operations.

TEXT BOOKS

1. Kai Hwang., Faye A. Briggs ,Computer Architecture and Parallel Processing .(1985). McGraw – Hill Book Company, Uttar Pradesh.
2. V. Rajaraman., C.Siva Ram Murthy, Parallel Computers Architectures and Programming. . (2003) PHI. New jersy.

REFERENCE BOOKS

1. Kai Hwang, (1993) Advanced Computer Architecture –Parallelism, Scalability, Programmability , McGraw Hill , Uttar Pradesh.
2. Michael J. Quinn , (2008) , Parallel Computing Theory and Practice. (2ndEdition) TMCH.
3. Barry Wilkinson., Michael Allen, (2007) Parallel Programming: Techniques and Applications. Prentice Hall.New jersy.
- 4.

BLENDED LEARNING:

UNIT	TOPICS	LINKS
V	Models of Computation	http://youtu.be/RVjvRR6hgbg
V	Analysis of Parallel Algorithms Prefix Computation	http://youtu.be/pVS3yhlzrIQ
V	Sorting	http://youtu.be/MePzuy8ub7Q
V	Searching	http://www.tutorialspoint.com/parallel_algorithm/parallel_search_algorithm.htm
V	Matrix Operations	http://www.tutorialspoint.com/parallel_algorithm/matrix_multiplication.htm

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	3	3	3	1	1	3	3	3	1	2	1	2	1
CO2	3	2	3	1	1	3	1	2	1	1	3	1	2	2
CO3	2	1	1	2	1	2	1	1	3	3	3	3	3	1
CO4	2	2	1	1	3	3	3	1	1	1	1	2	3	1
CO5	3	2	3	3	2	1	1	1	3	1	1	3	3	3

(Correlation : 3-High , 2- Medium,
1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Model Exam	Once in a semester
5	Assignment (Unit I and Unit II)	Twice in a semester
6	Seminar (Unit III and Unit IV)	Twice in a semester
7	Case Study (Unit V)	Once in a semester

Course designed by: Ms.M.Lincy Jacqueline

Verified by HOD: Ms.R.Uma Maheswari

Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by COE Principal
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SEMESTER : I

SUBJECT CODE: 23PCS1E02

**TITLE OF THE COURSE: ELECTIVE: NEURAL NETWORKS AND GENETIC
ALGORITHM (SKILL DEVELOPMENT)**

COURSE OBJECTIVES:

- To introduce the fundamentals of neural networks, fuzzy systems, and genetic algorithms.
- To understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic control and other machine intelligence applications of fuzzy logic.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Explain the basics of neural networks	K2
CO2	Narrate the Characteristics of Neural Networks	K3
CO3	Give a clear idea about the Fundamentals of Genetic Algorithms	K2
CO4	Explain the architecture and application of Backpropogation Networks	K4
CO5	Discuss about the ART architecture and relevant algorithms	K4

SYLLABUS

Credits – 5

Instructional hours – 75

UNIT I: Fundamentals Of Neural Networks (K2)

15 Hours

Introduction of Neural Networks - Basic Concepts of Neural Networks- Human Brain -
Model Of an Artificial Neuron - Neural Network Architectures - Characteristics of Neural
Networks - Learning Methods - Taxonomy of Neural Networks Architectures - History of

Neural Networks Research - Early Neural Network Architectures

UNIT II: Back propagation Networks (K3)

15 Hours

Architecture of a Back propagation Network – The perception Model – solution – single layer artificial neural network – Model for Multilayer Preceptron – Back propagation Learning – Input Layer – Hidden Layer – output layer – Calculation of error- training of Neural Network

- Illustration – Application

UNIT III: Back propagation Algorithms (K2)

15 Hours

Effect of Tuning Parameter of the Back propagation Neural Network – Selection of various parameters in BPN – Variations of Standard Back propagation Algorithm-Research Direction.

UNIT IV: Adaptive Resonance Theory (K4)

15 Hours

Introduction – Cluster Structure – Vector Quantization – Classical ART Networks – SimplifierART Architecture - ART1 - Architecture – Special features of ART1 Models – Algorithms - ART2 - Architecture - Algorithms -Application.

UNIT V: Genetic Algorithms (K4)

15 Hours

Fundamentals of Genetic Algorithms – History – Basic Concepts – Creation of off springs – working principles – Encoding – Fitness Functions – Reproduction.

(Self Study : Fitness Functions)

TEXT BOOKS

1. S.Rajasekaran,,G.A.Vijayalakshmi Pai, Neural Networks, Fuzzy Logic and Genetic Algorithms Synthesis and Applications- Prentice Hall of India PLTd, 2004.
2. Simon Hhaykin, Neural Networks A comprehensive foundations- Pearson Education 2nd Edition 2004

REFERENCE BOOKS

1. Li Min Fu, Neural Networks inComputer Intelligence- TMH 2003

- O. Karray, Clarence De Silva Fakhreddine, Soft Computing and Intelligent Systems Design- Pearson, 2009.
- Sivanandam.S.N and Deepa S. N, Principles of Soft Computing- Wiley India, 2008

BLENDLED LEARNING

UNIT	TOPICS	LINKS
V	Fundamentals of Genetic Algorithms	https://www.youtube.com/BbBxUaHJTNNI
V	History of Genetic Algorithm	https://www.youtu.be/I--TECUOnww
V	Basic Concepts of Genetic algorithm	https://www.youtu.be/9AoVsrz_R8g
V	Creation of off springs	https://www.youtu.be/inVJWW_NzFY
V	working principles	https://www.youtu.be/BmP3j5ypG5Y
V	Encoding	https://www.youtu.be/ekBHA0CtQZ0
V	Fitness Functions	https://www.youtu.be/xlk1gFIHMCQ
V	Reproduction.	https://www.youtu.be/TXezjHtlmhY

MAPPING OF CO'S WITH POs / PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	2	2	1	2	2	3	1	2	1	2	1
CO2	3	2	3	1	2	3	2	2	1	2	3	1	2	2
CO3	2	2	1	2	1	2	1	1	2	1	3	3	3	1
CO4	2	2	1	2	1	1	3	2	1	1	1	2	2	1
CO5	3	2	3	3	2	1	1	1	3	1	1	3	2	3

(Correlation : 3-High , 2- Medium,
1-Low)

ASSESMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester

4	Model Exam	Once in a semester
5	Assignment (Unit I and Unit II)	Twice in a semester
6	Seminar (Unit III and Unit IV)	Twice in a semester
7	Case Study (Unit V)	Once in a semester

Course designed by: Ms.M.Lincy Jacqueline	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by COE Principal

SEMESTER : I

COURSE CODE: 23PCS1CP1

TITLE OF THE COURSE: CORE: ADVANCED JAVA PROGRAMMING

(EMPLOYABILITY)

COURSE OBJECTIVE:

- On successful completion of this course the students should have the knowledge about the advanced concepts of JAVA.

COURSE OUTCOMES:

At the end of the Practical's the student will be able to

CO1	Develop Programs using GUI Framework , Events of AWT and swing components	K3
CO2	Develop program using Sockets and Networking concepts using database and servlets	K3
CO3	RECORD: Transfer the algorithmic work to program and the output of the program in the record presentation	K3

Credits -4

Instructional Hours-75

LIST OF PRACTICALS

INTERNET AND JAVA LAB

Dr.R.Kavitha

Dr.N.A.Sheela Selvakumari

Dr.R.Vijayabanu

Ms.R.Janane Priya

Mrs.S.Esther Darthi

1. Exception Handling
2. Packages
3. Interfaces
4. Multithreading
5. Collections in Interfaces
6. Collection in classes
7. Swing application
8. Sockets Programming
9. Java Bean

CASE STUDY

1. Swings and JDBC
2. Servlet
3. RMI

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	1	1	2	1	1	3	3	3	1
CO2	3	3	3	3	2	1	1	2	2	1	3	3	2	3
CO3	2	3	3	3	3	3	3	2	1	3	3	2	2	3

(Correlation : 3-High , 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester

3	CIA II	Once in a semester
4	Record	Once in a semester

Course designed by : Ms.R.Ushadevi	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER: I

COURSE CODE: 23PCS1CP2

TITLE OF THE COURSE: CORE LAB: ANALYSIS AND DESIGN OF ALGORITHMS

COURSE OBJECTIVES:

- To understand the fundamental concepts of design and analysis techniques of algorithms with act on data structures.
- To discuss various algorithm design strategies with proper illustrative examples.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Explain divide and conquer methods and synthesize greedy algorithms.	K2
CO2	Describe the various terminologies of graphs and trees, use them for various applications.	K2
CO3	RECORD: Transfer the algorithmic work to program and the output of the program in the record presentation	K3

Credits -4

Instructional Hours-75

LIST OF PRACTICALS:

Dr.R.Kavitha Dr.N.A.Sheela Selvakumari Dr.R.Vijayabanu Ms.R.Janane Priya Mrs.S.Esther Darthi

1. Merge Sort.
2. Quick Sort.
3. Binary Search.
4. Knapsack problem.
5. Minimum Spanning Trees.
6. Traveling salesman problem.
7. All Pair Shortest Path.
8. Eight Queen Problem.
9. Hamiltonian Problem.
10. Graph Coloring.

MAPPING OF CO'S WITH Pos AND PEOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	2	1	3	2	1	3	3	3	3	3	3	1
CO2	3	3	3	3	3	2	1	1	2	3	1	2	3	2
CO3	2	3	2	1	1	2	2	1	2	3	3	3	3	3

(Correlation : 3-High , 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Record	Once in a semester

Course designed by: Ms.S.Pradeepa	Verified by HOD: Ms.R.Uma Maheswari
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Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal
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SEMESTER: II

COURSE CODE: 23PCS2C04

TITLE OF THE COURSE : CORE: DATA COMMUNICATION AND NETWORKS
(SKILL DEVELOPMENT)

COURSE OBJECTIVES:

- To understand fundamental concepts of computer networking.
- To Familiarize with the basic taxonomy and terminology of Local Area Networks.

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1	Discuss the basic communication model and the protocols	K2
CO2	Apply Digital Data Communication Techniques, Data Link Control Protocols	K3
CO3	Illustrate the appropriate routing and switching concepts	K2
CO4	Discuss Local Area Network Overview and its Architecture	K2
CO5	Examine the performance analysis of a Wireless LAN's and Network Security	K4

SYLLABUS

Credits -4

Instructional Hours-75

UNIT-I: Overview of Data Communications and Networks (K2)

15 hours

A Communication Model - Data Communications – Networks-An Example Configuration.
Need for a Protocol Architecture - TCP/IP Protocol Architecture - OSI Model - Guided
Transmission Media - Wireless Transmission.

UNIT-II: Digital Data Communication Techniques, Data Link Control Protocols (K3)

15 hours

Asynchronous and Synchronous Transmission - Types of Errors - Error Detection - Error Correction - Line Configuration – Interfacing - Flow Control - Error Control – High - Level Data Link Control.

UNIT-III: Switching and Congestion Control in Data Networks (K2)

15 hours

Switched Communication Networks - Circuit - Switching Networks - Concepts - Packet-Switching Principles - X.25 - Frame Relay- Routing in Packet - Effects of Congestion - Congestion Control - Traffic Management.

UNIT-IV: Overview of LAN and High-Speed LAN (K2)

15 hours

Local Area Network Overview - Background - Topologies and Transmission Media - LAN Protocol Architecture – Bridges - The Emergence of high speed LAN - Ethernet - Fiber Channel.

(Beyond the Curriculum : Internet network management framework, Security in Computer Networks)

UNIT-V: Wireless LAN and Network Security (K4)

15

hours Basic Protocol Functions - Principles of Internetworking - Internet Protocol - Security Requirements and Attacks - Confidentiality with Conventional Encryption - Message Authentication and Hash Function - Public - Key Encryption and Digital Signatures.

(Self Study: Wireless LAN Technology)

TEXT BOOK

1. William Stallings. (2006). Data Computer Communications. (8th Edition) . Pearson Education Pvt. Ltd , New York.

REFERENCE BOOKS

1. ISRD Group .(2006) .Data communication and computer networks. (1st edition) Tata Mc Dr.R.Kavitha Dr.N.A.Sheela Selvakumari Dr.R.Vijayabanu Ms.R.Janane Priya Mrs.S.Esther Darthi

Graw Hill Publishing Company Ltd , New Delhi.

2. Gupta P.C , (2006) , Data Communications and Computer Networks. (4thedition) , PHI , New Delhi.
3. Singh Brijendra.(2006). Data Communications and Computer Networks. (2nd Edition).PHI New Delhi.

BLENDED LEARNING

UNIT	TOPICS	LINKS
V	Wireless LAN Technology Infrared and spread spectrum	https://www.youtube.com/watch?v=-VZKWUcad14
V	Principles of Internetworking	https://www.youtube.com/watch?v=ptRHvYaa_yM
V	Internet Protocol IPV4	https://www.youtube.com/watch?v=hDjylWgWy10
V	Security Requirements	https://www.youtube.com/watch?v=BKtAkDwg6ZQ
V	Attacks in Network Security	https://www.youtube.com/watch?v=_zq4qTc9Jmg
V	Confidentiality with conventional Encryption in data communication network	https://www.youtube.com/watch?v=-iXnITXOvM4
V	Message Authentication And Hash Function	https://www.youtube.com/watch?v=Fr2fQIQIokY

V	Public Key Encryption In Data Communication Network	https://www.youtube.com/watch?v=ERp8420ucGs
V	Digital Signature	https://www.youtube.com/watch?v=TmA2QWLSLSPg ()

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	1	1	2	1	1	3	3	3	1
CO2	3	3	3	3	3	1	1	2	2	1	3	3	1	3
CO3	2	3	3	3	3	3	3	2	1	3	3	1	1	3
CO4	2	3	3	3	1	1	1	2	1	3	3	3	3	2
CO5	2	3	3	3	3	1	1	2	2	3	3	3	1	2

(Correlation : 3-High , 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Model Exam	Once in a semester
5	Assignment (Unit I and Unit II)	Twice in a semester
6	Seminar (Unit III and Unit IV)	Twice in a semester

7	Case Study (Unit V)	Once in a semester
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Course designed by: Ms.C,Clement Sherlin	Verified by HOD: Ms.R .Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER : II

COURSE CODE : 23PCS2C05

TITLE OF THE COURSE : CORE: ADVANCED OPERATING SYSTEMS

(SKILL DEVELOPMENT)

COURSE OBJECTIVES:

- To understand the operating system concepts and to inculcate the knowledge of concepts in implementing the IPC problems
- To have a deep knowledge in distributed operating systems.
- To gain experience in Linux operating systems commands

COURSE OUTCOMES:

At the end of the course the student will be able to:

CO1	Discuss the fundamentals concepts of operating systems.	K2
CO2	Examine the various IPC problems with algorithms	K4
CO3	Identify the design, implementation and security issues of distributed system	K2
CO4	Express the important Linux shell commands and file management techniques.	K2
CO5	Demonstrate data and process management concepts in Linux platform	K3

SYLLABUS

Credits -4

Instructional Hours-75

Dr.R.Kavitha

Dr.N.A.Sheela Selvakumari

Dr.R.Vijayabanu

Ms.R.Janane Priya

Mrs.S.Esther Darthi

UNIT - I: Operating System Concepts (K2)**15 hours**

Computer Hardware review - Operating System Concepts - Process Model – Process Creation - Process Termination – Process Hierarchy – Process States – Implementation of Processes - Thread Usage – Implementation of Threads in User Space and Kernel space
(Self Study : Process Model – Process Creation - Process Termination – Process Hierarchy – Process States)

UNIT - II: Inter Process Communication(K4)**15 hours**

Inter Process Communication – Race condition – Critical Region – Mutual Exclusion with Busy waiting – Sleep and wakeup – Semaphores – Mutexes – Message Passing - The Dining Philosophers Problem – The Readers and Writers Problem.

UNIT - III: Distributed Operating System (K2)**15 hours**

Distributed Computing system Models – Distributed Operating Systems – Issues in designing distributed operating system - Remote Procedure Calls - The RPC Model - Transparency of RPC - Implementing RPC mechanism – Stub Generation - RPC Messages
- Server Management - Parameter-Passing Semantics – Call Semantics - Communication Protocol for RPCs - Distributed File System Features - File Models - File - Accessing Models - File Sharing Semantics – File Caching Schemes - File Replication .
(Beyond the Curriculum : Distributed Storage System)

UNIT - IV : LINUX -Shell Commands And File Management (K2) 15 hours

Shell-Pipes And Redirection-Shell Programming Language-Shell Syntax –variables, conditions, control structures, functions, commands, command execution - Linux File Structure-Low-Level File Access- Standard I/O Library - File And Directory Maintenance - Scanning Directories .

UNIT - V: LINUX- Data Management And Processes (K3)**18**

hours Simple memory allocation – allocating lots of memory - Creating lock files – locking regions - use of read and write with locking - The dbm database – the dbm routines - dbm access functions - Process-Process Structure - Starting New Processes - POSIX Threads program - simultaneous execution - Pipes-Process Pipes-Sending Output To popen.

TEXT BOOKS :

1. Andrew S.Tanenbaum. Modern Operating Systems.(3rdedition).PHI/Pearson Education Asia , New York.
2. Pradeep K. Sinha.(2007).Distributed operating systems concepts and design .Prentice - Hallof India , New Delhi.
3. Neil Mathew.,Richard Stones.(2016).Beginning LINUX Programming . (4th edition) .Wrox,Wiley India Pvt, Ltd , New Jersey.

REFERENCE BOOKS:

1. William Stallings. (2010) . Operating Systems .(6th Edition). Prentice Hall of India , New Delhi.
2. Abraham Silberschatz ., Greg Gagne., Peter B. Galvin. , (2009), Operating System Concepts.(9th edition) , Pearson Education. , New York.
3. H MDeital., P J Deital., D R Choffnes. (2004) .Operating Systems.(3rdedition) .Pearson Education. , New York.
4. K.L.James. (2012). Linux Learning the Essentials. (3rd edition). PHI Learning Private Limited , New Delhi

BLENDED LEARNING

UNIT	TOPICS	LINKS
V	Simple memory allocation	https://youtu.be/ZFw6u11rOf0
V	Creatinglockfiles–lockingregions	https://youtu.be/0wrdcxkgujc
V	Thebdbdatabase	https://youtu.be/2mQKWYBcUg4
V	Process-ProcessStructure	https://youtu.be/P8GrPOpD8Sk
V	POSIXThreadsprogram	https://youtu.be/ynCc-v0K-do
V	Pipes-ProcessPipes	https://youtu.be/vPYsoiT99Xk
V	Sending Output Top open	https://youtu.be/Eyscu3ByNtg

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

CO1	1	1	3	1	3	3	3	1	3	2	1	3	3	1
CO2	3	1	3	2	1	1	3	1	2	1	3	1	3	3
CO3	3	2	3	1	2	1	1	2	2	3	3	3	1	2
CO4	1	2	1	3	1	2	1	3	1	3	1	3	3	3
CO5	1	2	3	1	3	2	3	1	3	1	3	3	1	3

(Correlation: 3-High , 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Model Exam	Once in a semester
5	Assignment (Unit I and Unit II)	Twice in a semester
6	Seminar(Unit III and Unit IV)	Twice in a semester
7	Group Discussion (Unit V)	Once in a semester

Course designed by: Ms.M.Lincy Jacqueline	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER: II

COURSE CODE:23PCS2C06

TITLE OF THE COURSE : CORE: ADVANCED PYTHON PROGRAMMING

(EMPLOYABILITY)

COURSE OBJECTIVES:

- To inculcate the concepts of OOPS and File handling in python.
- To learn the various applications programming using python.
- To implement GUI, database and Web based programming using python

COURSE OUTCOMES:

At the end of the course the student will be able to:

CO1	Discuss the domain concepts of python scripting to develop real world applications.	K2
CO2	Design simple programs using control structures.	K6
CO3	Demonstrate the usage of object oriented features.	K3
CO4	Develop applications using Graphics and Modules.	K6
CO5	Design programs using tkinter Widgets and database.	K6

SYLLABUS

Credits -4

Instructional hours - 75

UNIT I: Object oriented Programming Concepts (K2)

15 hours

Classes and Objects-Class Method and SELF argument-the class constructor init()method- class variables and object variables -del()method, special methods-public and private data members-built in class attributes-private methods-class methods-static methods-Inheritance: Inheriting classes in python-types of inheritance-complex objects-Abstract classes and interfaces-meta class-Operator Overloading

UNIT II: Exception Handling (K6)

15 hours

Errors and exceptions –Handling exceptions–Multiple except blocks-Multiple exceptions in a single block –except block without exception-the else clause-RaisingExceptions-Built in and user defined exceptions- The finally block-pre defined cleanup action- Re-raising Exception-Functions and Modules: Modules-

Packages in python

(Self Study: Multiple except block)

UNIT III: Network Programming (K3)

15 hours

Regular expressions-Special Symbols and characters-Regexes and Python-
Network Programming: Network Programming in Python-The Socket Server
Module- Introduction to twisted framework-Internet and Client Programming.

UNIT IV: Multi threaded Programming (K6)

15

hours Threads and processes –Threads and Python-The Thread Module-The
Threading- Comparing single vs multi threaded Execution –Multi threading in
practice- Alternative considerations to threads- related modules. Database
Programming: The python DB-API-ORMs-Non relational Databases-Extending
Python:

Writingextensions

(Beyond the Curriculum :Context Managers)

UNIT V: Web Programming (K6)

15 hours

Web Clientsand servers-Python Web Client tools-Web Clients-Web Servers-
RelatedModules-Web Programming CGI and WSGI-Building CGI Applications-
Using Unicodewith CGI-Advanced CGI-Introduction to WSGI-Real world web
development -relatedmodules.

TEXTBOOKS

1. Reema Thareja, (2012) , Python Programming Using Problem Solving Approach,
(First Edition) , Oxford University Press, England ., Isbn-13: 978-0-19-948017.
2. WesleyJ.Chun, (2009) , Core Python Applications Proramming, (Third Edition) ,
Pearson Publications, New york.

REFERENCE BOOKS

1. Sheetal Taneja , Naveen Kumar, (2018) , Python Programming, A Modular Approach,
Pearson Publications, New York.
2. Kenneth A.Lambert, Mrtin Osborne. (2018) , Fundamentals Of Python, First Edition.
Cengage Publication, Uttar Pradesh.

3. Rao R. Nageswara, (2018) , Core Python Programming , (2nd Edition) , Dream tech Press India Pvt. Ltd , New Delhi.

BLENDED LEARNING:

UNIT	TOPICS	LINKS
V	Web Clients and servers	https://youtu.be/L5BlpPU_muY
V	Python Web Client tools	https://youtu.be/tb8gHvYICFs
V	Web Clients, Web Servers	https://youtu.be/B8azMzrluHE
V	Web Programming CGI and WSGI	https://youtu.be/WqrCnVAkLJo
V	Building CGI Applications	https://youtu.be/GVONOAED5E
V	Using Unicode with CGI, Advanced CGI	https://youtu.be/GVONOAED5E
V	Introduction to WSGI	https://youtu.be/UklcIDgHtwQ
V	Real world web development –related Modules	https://youtu.be/ysFJHpS-O08

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	3	1	1	3	1	1	3	3	1	3	1	3
CO2	3	1	2	2	1	3	1	3	1	3	3	1	1	3
CO3	3	2	2	2	3	3	2	1	3	3	1	1	2	3
CO4	3	3	2	3	3	3	2	2	3	1	2	2	2	3
CO5	3	3	3	3	3	3	3	3	1	3	3	3	3	3

(Correlation: 3-High , 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester

2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Model Exam	Once in a semester
5	Assignment (Unit I and Unit II)	Twice in a semester
6	Seminar (Unit III and Unit IV)	Twice in a semester
7	Group Discussion (Unit V)	Once in a semester

Course designed by: Ms.C.Clement Sherlin	Verified by HOD: Ms.R.UmaMaheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER : II
COURSE CODE: 23PCS2E01

TITLE OF THE COURSE : ELECTIVE -MACHINE LEARNING
(EMPLOYABILITY)

COURSE OBJECTIVES:

- To study the various probability based learning techniques
- To understand graphical models of Machine learning algorithms.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Distinguish between Supervised , Unsupervised and Semi supervised Learning.	K2
CO2	Apply the apt Machine Learning strategy for any given problem.	K3

CO3	Suggest Supervised, Unsupervised and Semi supervised Learning Algorithms for any given problem.	K2
CO4	Design systems that use the appropriate graph models of Machine Learning.	K4
CO5	Modify existing Machine Learning algorithms to improve classification efficiency.	K4

SYLLABUS

Credits – 4

Instructional hours – 75

UNIT I: Introduction (K2)

15 Hours

Learning-Types of Machine Learning-Supervised Learning-The Brain and the Neuron-Design a Learning System-Perspectives and Issues in Machine Learning-Concept Learning-Task-Concept Learning as Search-Finding a Maximally Specific Hypothesis-Version Spaces and the Candidate Elimination Algorithm-Linear Discriminants –Perceptron -Linear Separability-Linear Regression.

UNIT II: Linear Models

(K3) 15 Hours

Multi-layer Perceptron-Going Forwards-Going Backwards: Back Propagation Error-Multi-layer Perceptron in Practice-Examples of using the MLP-Overview-Deriving Back propagation-Radial Basis Functions and Splines-Concepts-RBF Network-Curse of Dimensionality-Interpolations and Basis Functions-Support Vector Machines.

(Self-Study-RBF Network)

UNIT III: Tree and Probabilistic Models (K2)

15 Hours

Learning with Trees-Decision Trees-Constructing Decision Trees-Classification and Regression Trees-Ensemble Learning-Boosting-Bagging-Different ways to Combine Classifiers-Probability and Learning-Data into Probabilities-Basic Statistics-Gaussian Mixture Models-Nearest Neighbor Methods-Unsupervised Learning-K means Algorithms-Vector Quantization-Self Organizing Feature Map.

UNIT IV: Dimensionality Reduction and Evolutionary Models (K4) 15 Hours

Dimensionality Reduction-Linear Discriminant Analysis-Principal Component

Analysis- Factor Analysis-Independent Component Analysis-Locally Linear Embedding-Iso map- Least Squares Optimization-Evolutionary Learning-Genetic Algorithms-Genetic Offspring:-Genetic Operators-Using Genetic Algorithms-Reinforcement Learning- Overview-Getting Lost Example-Markov Decision Process.

UNIT V: Graphical Models (K4)

15 Hours

Markov Chain Monte Carlo Methods-Sampling-Proposal Distribution-Markov Chain Monte Carlo-Graphical Models-Bayesian Networks Markov Random Fields-Hidden Markov Models-Tracking Methods.

TEXTBOOKS

1. Stephen Marsland, (2013) , Machine Learning –An algorithmic perspective, (Second Edition), Chapman and Hall/CRC Machine Learning and Pattern Recognition Series, 2014.
2. Tom M Mitchell, (2013) , Machine Learning, (First Edition) , Mc Graw Hill Education , Uttar Pradesh.

REFERENCE BOOKS

1. Peter Flach, , (2012) , Machine Learning : The art and science of Algorithms that make sense of data, First Edition , Cambridge University Press, England.
2. Jason Bell, (2014) , Machine Learning –Hands for Developers and Technical Professionals II, (First Edition) , Wiley publications , Hobokem , New jersey.
3. Ethem Alpaydin , (2014) , Introduction to Machine Learning 3e (Adaptive Computation and Machine Learning Series)I, (Third Edition) ,MIT Press, Cambridge.

BLENDED LEARNING

UNIT	TOPICS	LINKS
V	Markov Chain Monte Carlo Methods	https://machinelearningmastery.com/markov-chain-monte-carlo-for-probability/
V	Proposal Distribution	https://www.sciencedirect.com/topics/computer-science/proposal-distribution

V	Markov Chain Monte Carlo- Graphical Models	https://machinelearningmastery.com/markov-chain-monte-carlo-for-probability/
V	Bayesian Networks Markov Random Fields	https://en.wikipedia.org/wiki/Markov_random_field
V	Markov Models	https://towardsdatascience.com/introduction-to-hidden-markov-models-cd2c93e6b781
V	Tracking Methods.	https://towardsdatascience.com/people-tracking-with-machine-learning-d6c54ce5bb8c

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	1	3	3	3	3	3	3	3	3	3	2	1
CO2	3	3	3	3	3	3	3	3	1	2	1	12	2	2
CO3	1	3	1	1	1	3	3	3	3	3	3	3	3	2
CO4	2	3	1	3	2	1	2	2	1	3	2	3	2	1
CO5	3	1	1	2	1	3	2	2	1	3	3	3	3	3

(Correlation: 3-High , 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Assignment (Unit I and Unit II)	Twice in a Semester
5	Seminar (Unit III and Unit IV)	Twice in a Semester
6	Group Discussion (Unit V)	Once in a Semester

Course designed by: Ms.P.Avila Clemenshia	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

**SEMESTER : II
COURSE CODE: 23PCS2E02**

**TITLE OF THE COURSE:ELECTIVE: SOFT COMPUTING
(EMPLOYABILITY)**

COURSE OBJECTIVES:

- To learn the basic concepts of Soft Computing
- To become familiar with various techniques like neural networks, genetic algorithms and fuzzysystems.

COURSE OUTCOMES

At the end of the course the student will be able to

CO1	Apply soft computing techniques to solve problems.	K1
CO2	Apply suitable soft computing techniques for various applications.	K2
CO3	Integrate various soft computing techniques for complex problems.	K3
CO4	Apply different mechanisms to design algorithms in programming context.	K1
CO5	Apply accessing and arranging techniques in various real time applications	K5

SYLLABUS

Credits- 5

Instructional Hours - 75

UNIT I : INTRODUCTION TO SOFT COMPUTING

15 hours

Introduction-Artificial Intelligence-Artificial Neural Networks-Fuzzy Systems-Genetic Algorithm and Evolutionary Programming-Swarm Intelligent Systems-Classification of ANNs-McCulloch and Pitts Neuron Model-Learning Rules: Hebbian and Delta-Perceptron Network-Adaline Network-Madaline Network.

(Self Study : Hebbian and Delta- Perceptron Network)

UNIT II: ARTIFICIAL NEURAL NETWORKS

15 hours

Back propagation Neural Networks - Kohonen Neural Network -Learning Vector Quantization -Hamming Neural Network - Hopfield Neural Network- Bi-directional Associative Memory -Adaptive Resonance Theory Neural Networks- Support Vector Machines - Spike Neuron Models.

UNIT III: FUZZY SYSTEMS

15 hours

Introduction to Fuzzy Logic, Classical Sets and Fuzzy Sets - Classical Relations and Fuzzy Relations -Membership Functions -Defuzzification - Fuzzy Arithmetic and Fuzzy Measures

- Fuzzy Rule Base and Approximate Reasoning - Introduction to Fuzzy Decision Making.

UNIT IV: GENETIC ALGORITHMS

15 hours

Basic Concepts- Working Principles -Encoding- Fitness Function - Reproduction - Inheritance Operators - Cross Over - Inversion and Deletion -Mutation Operator - Bit-wise Operators -Convergence of Genetic Algorithm.

UNIT V: HYBRID SYSTEMS

15 hours

Hybrid Systems -Neural Networks, Fuzzy Logic and Genetic -GA Based Weight Determination - LR-Type Fuzzy Numbers - Fuzzy Neuron - Fuzzy BP Architecture - Learning in Fuzzy BP- Inference by Fuzzy BP - Fuzzy ArtMap: A Brief Introduction - SoftComputing Tools - GA in Fuzzy Logic Controller Design - Fuzzy Logic Controller.

TEXT BOOKS:

1. N.P.Padhy, S.P.Simon, "Soft Computing with MATLAB Programming", Oxford University Press, 2015.

2. S.N.Sivanandam , S.N.Deepa, "Principles of Soft Computing", Wiley India Pvt.Ltd., 2nd Edition, 2011.

3. S.Rajasekaran, G.A.Vijayalakshmi Pai, "Neural Networks, Fuzzy Logic and Genetic

Dr.R.Kavitha Dr.N.A.Sheela Selvakumari Dr.R.Vijayabanu Ms.R.Janane Priya Mrs.S.Esther Darthi

Algorithm,

Synthesis and Applications ", PHI Learning Pvt.Ltd., 2017.

REFERENCES

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, —Neuro-Fuzzy and Soft Computing||, Prentice-Hall of India, 2002.
2. Kwang H.Lee, —First course on Fuzzy Theory and Applications||, Springer, 2005.
3. George J. Klir and Bo Yuan, —Fuzzy Sets and Fuzzy Logic-Theory and Applications||, Prentice Hall, 1996.
4. James A. Freeman and David M. Skapura, —Neural Networks Algorithms, Applications, and Programming Techniques||, Addison Wesley, 2003.

BLENDED LEARNING

UNIT	TOPICS	LINKS
V	Basic Concepts	http://youtu.be/9AoVsrz_R8g
V	Working Principles	http://youtu.be/BmP3j5ypG5Y
V	Encoding	http://youtu.be/WYUOOYxEhVw
V	Fitness Function	http://youtu.be/N7pmxJi8t3g
V	Reproduction	http://youtu.be/TXezjHtlmhY
V	Inheritance Operators	http://youtu.be/8PBO8CE1VKc
V	Cross Over - Inversion and Deletion -Mutation Operator - Bit-wise Operators	http://youtu.be/ptd5DA-GUVs
V	Convergence of Genetic Algorithm	http://youtu.be/43kYLpuZW04

MAPPING OF CO'S WITH POs AND PEOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	1	1	1	1	1	1	2	2	2	3	1

Dr.R.Kavitha

Dr.N.A.Sheela Selvakumari

Dr.R.Vijayabanu

Ms.R.Janane Priya

Mrs.S.Esther Darthi

CO2	3	3	2	1	2	1	1	1	1	1	2	2	3	2
CO3	3	3	1	2	1	2	2	1	1	2	2	3	3	2
CO4	3	3	2	2	1	1	1	2	1	1	3	3	3	3
CO5	3	3	3	3	2	1	2	1	1	2	3	3	3	3

(Correlation: 3-High, 2- Medium,
1-Low)

ASSESSMENT TOOLS:

S.NO	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Model Exam	Once in a semester
5	Assignment	Twice in a semester
6	Seminar	Once in a semester
7	Online Quiz	Once in a Semester

Course designed by: Mrs.C.Clement Sherlin	Verified by HOD: Ms. R. Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER:II

COURSE CODE: 23PCS2CP3

TITLE OF THE COURSE: CORE LAB: ADVANCED PYTHON PROGRAMMING
(EMPLOYABILITY)

Dr.R.Kavitha

Dr.N.A.Sheela Selvakumari

Dr.R.Vijayabanu

Ms.R.Janane Priya

Mrs.S.Esther Darthi

COURSE OBJECTIVE:

- To gain the knowledge about the Advanced concepts of PYTHON

COURSE OUTCOMES:

At the end of the Practical's the student will be able to

CO1	Interpret the basic principles of Python programming language and Object – Oriented Programming.	K3
CO2	Implement database , GUI applications and Machine Learning Algorithms.	K3
CO3	RECORD: Transfer the algorithmic work to program and the output of the program in therecord presentation	K3

Credits-4

Instructional hours-75

LIST OF PRACTICALS

1. Programs based on lists, conditional constructs, the for statement and the rangefunction; interactively using the built-in functions len, sum, max, min
2. Programs related to string manipulation
3. Programs based on the while statement ; importing and executing built-in functionsfrom the time, math and random modules
4. Programs related to dictionaries
5. Programs using list comprehensions and anonymous functions
6. Programs using the built-in methods of the string, list and dictionary classes
7. Program to implement recursion.
8. Program to implement inheritance
9. Program to handle exception
10. Program to add widgets and to handle events.

CASESTUDY:

1. Vehicle Rental Agency system.
2. Credit Card Calculation.

MAPPING OF CO'S WITH POs AND PSOs

Dr.R.Kavitha

Dr.N.A.Sheela Selvakumari

Dr.R.Vijayabanu

Ms.R.Janane Priya

Mrs.S.Esther Darthi

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	3	1	1	3	1	1	3	3	1	3	1	3
CO2	3	1	2	2	1	3	1	3	1	3	3	1	2	3
CO3	2	2	2	2	3	3	3	1	3	3	1	1	2	3

(Correlation: 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Record	Once in a semester

Course designed by :Ms.C.Clement Sherlin	Verified by HOD: Ms.R.UmaMaheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER : II

COURSE CODE:23PCS2CP4

TITLE OF THE COURSE : CORE LAB: LINUX PROGRAMMING

(EMPLOYABILITY)

COURSE OBJECTIVES:

Dr.R.Kavitha

Dr.N.A.Sheela Selvakumari

Dr.R.Vijayabanu

Ms.R.Janane Priya

Mrs.S.Esther Darthi

- To develop the Linux programs using the Shell Script
- To implement the system calls, fork and exec commands

COURSE OUTCOMES:

At the end of the Practical's the student will be able to

CO1	Interpret the basic principles of operating system and performing basic action using front end	K3
CO2	Implement basic file operation , File directory encryption, and to check server Utilization	K3
CO3	RECORD: Transfer the algorithmic work to program and the output of the program in the record presentation	K3

Credits: 5

Instructional Hours: 75

LIST OF PRACTICALS

1. To check the status of file using test command.
2. To find the grade of student's marks.
3. Menu driven shell program to perform the following.
 - i) Enter the sentence in file.
 - ii) Search a whole worded in an existing file. iii)Quit.
4. To perform case conversion.
5. To find the sum of digits.
6. To find the biggest of three numbers using command line arguments.
7. Check for sufficient number of command line arguments.
8. To copy, delete and renaming a file.
9. To Check Server Utilization.
10. To encrypt the File/directory.
11. To create colourful texts.
12. Implementation of system calls– Open, read and close. Create, write, lseek, stat,fstat.
13. Implementation of fork & exec.

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	3	1	1	3	1	1	3	3	1	3	1	3
CO2	3	1	2	2	1	3	1	3	1	3	3	1	2	3
CO3	2	2	2	2	3	3	3	1	3	3	1	1	2	3

(Correlation: 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Record	Once in a semester

Course designed by: Ms.M.Lincy Jacqueline	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER: III

COURSE CODE: 23PCS3C07

TITLE OF THE COURSE : CORE:DIGITAL IMAGE PROCESSING

(EMPLOYABILITY)

COURSE OBJECTIVES:

- To comprehend the knowledge of digital image processing techniques.
- To instill image enhancement and restoration techniques for applying them in

various fields.

- To impart the knowledge of image compression algorithms to improve the storage efficiency.

COURSE OUTCOMES:

At the end of the course the students will be able to:

CO1	Examine the fundamentals of digital image processing system	K4
CO2	Discuss various transforms and image enhancement techniques	K2
CO3	Examine various techniques of image restoration along with image degradation function	K4
CO4	Analyzing various color models and image compression techniques	K4
CO5	Classifying image segmentation algorithms and Thresholding principles	K3

SYLLABUS

Credits -4

Instructional Hours-75

UNIT- I: Fundamentals of Digital Image Processing

15

hours Introduction to Image Processing: Overview of Image Processing- Nature of Image Processing –Image Processing and related fields-Digital Image Representation- Types of images. Digital Images-DIP Operations- Fundamental steps in Image Processing-Image Processing Applications-Digital Imaging System: Overview of Digital Imaging System- Physical Aspects of Image Acquisition-Biological Aspects of Image Acquisition-Sampling and Quantization-DIP Operations-Basic relationship and distance Metrics-Classification of DIP operations

UNIT-II: Image Transforms and Enhancement Techniques

15

hours Digital Image Transforms:-Need for Image Transforms-Discrete Cosine Transform- Discrete Sine Transform. Image Enhancement:-Image Quality and need for Image Enhancement-Image Enhancement Operations-Image Enhancement in Spatial Domain- Histogram based Techniques-Spatial Filtering Concepts-Image Smoothing Spatial Filters: Gaussian Filters. Image Sharpening Spatial Filters:-Gradient and

Laplacian Filters-Image Smoothing in Frequency Domain Filtering: Gradient Low-Pass Filters-Image Sharpening in Frequency Domain:-Gradient High-Pass Filters

UNIT-III: Degradation along with the image restoration techniques **15 hours**

Image Restoration: Introduction to degradation-Types of Degradations – Point Spread Function and Modulation Transfer Function-Image Degradation Model. Noise Modeling - Estimation of Degradation Functions. Image Restoration in presence of Noise only- Image restoration Techniques: Inverse Filters-Blind Image Restoration

(Beyond the Curriculum : Wiener filter , constrained least square filter)

UNIT-IV: Color Image Processing, Image Compression **15 hours**

Color Image Processing:-Introduction-Color Image Storage and Processing-Color Models:- RGB Color Model-HSV Color Model.

Images compression: Image compression model-Compression Algorithm and its types- Types of Redundancy-Lossless Compression Algorithms-Lossy Compression Algorithms.

UNIT-V: Image Segmentation **15 hours**

Image Segmentation: Introduction-Classification of Image Segmentation Algorithms- Detection of Discontinuities-Edge Detection-Hough Transform and Shape Detection- Corner Detection-Principle of Thresholding-Principle of Region-Growing.

(Self Study : Principle of Region-Growing)

TEXT BOOK

1. S.Sridhar. Digital Image Processing. (2nd Edition).Oxford University Press , England.

REFERENCE BOOKS

1. Rafael C. Gonzalez., Richard E. Woods , (2010) , Digital Image Processing .(2nd Edition). PHI/Pearson Education , London.
2. Anil K. Jain. (2012) , Fundamentals of Digital Image Processing. Prentice Edition Hall of India , New Delhi.
3. B.Chanda. D.Dutta Majumder. (2003).Digital Image Processing and Analysis.(2nd Edition) , Prentice Edition Hall of India , New Delhi.
4. Nick Efford. (2004) .Digital Image Processing a Practical Introduction using JAVA.Pearson education , London.

BLENDED LEARNING

Dr.R.Kavitha Dr.N.A.Sheela Selvakumari Dr.R.Vijayabanu Ms.R.Janane Priya Mrs.S.Esther Darthi

UNIT	TOPICS	LINKS
V	Introduction to Image Segmentation	https://www.youtube.com/watch?v=RsJA3OUN1ZY
V	Detection of Discontinuities, Edge Detection	https://www.youtube.com/watch?v=3qJej6wgezA ; https://www.youtube.com/watch?v=-pmUQ6RSejQ
V	Hough Transform and Shape Detection	https://www.youtube.com/watch?v=NFtPH2REs28 ; https://www.youtube.com/watch?v=4zHbI-fFIII
V	Corner Detection	https://www.youtube.com/watch?v=8aNOzglbaeA ; https://www.youtube.com/watch?v=WyrVzTRZuXA
V	Principle of Thresholding	https://robotacademy.net.au/lesson/image-thresholding/ ; https://www.youtube.com/watch?v=vtbdqg7yAcc
V	Principle of Region Growing)	https://www.youtube.com/watch?v=8W-qVdzYs8I ; https://www.youtube.com/watch?v=DJwvm0om4Sk ; https://www.youtube.com/watch?v=01nm-w6-mKA

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	3	3	3	3	3	3	1	3	3	3	1
CO2	3	3	3	1	3	3	3	3	3	3	3	3	3	2
CO3	3	2	3	1	1	3	3	3	3	3	1	2	2	1
CO4	3	3	1	1	1	3	3	3	3	3	1	2	3	2
CO5	3	3	2	1	1	2	1	1	1	1	1	2	3	3

(Correlation: 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester

3	CIA II	Once in a Semester
4	Model Exam	Once in a Semester
5	Assignment (Unit I and Unit II)	Twice in a Semester
6	Seminar (Unit III and Unit IV)	Twice in a Semester
7	Paper Presentation (Unit V)	Once in a Semester

Course designed by: Ms.R.Ushadevi	Verified by HOD: Ms.R.UmaMaheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER: III

COURSE CODE: 23PCS2C08

TITLE OF THE COURSE : CORE: DATA MINING WITH R
(EMPLOYABILITY)

COURSE OBJECTIVES:

- To understand the various the basic Task of Data Mining , Web Mining and Text Mining.
- To inculcate the knowledge on the concept of classification and Clustering and implementing using R tool.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Discuss the fundamentals concepts and metrics of data mining.	K2
CO2	Differentiate various classification Algorithms	K1
CO3	Experiment the various Measures , Algorithms, Association Rules and their Techniques	K3

CO4	Interpret R tool syntax , object and Function	K2
CO5	Analyze the data using R Graphics with various Distributions Models.	K4

SYLLABUS

Credits -4

Instructional Hours-75

UNIT – I : Introduction To Data Mining

15 hours

Basic data mining tasks – data mining versus knowledge discovery in databases – data mining issues – data mining metrics –Introduction to Data mining techniques – a statistical perspective on data mining – similarity measures - Introduction to Web mining–Web content mining –Web structure mining –Web usage mining –Text mining- Text clustering

– Temporal Mining-Sequence mining-Spatial mining.

(Self Study :A Statistical perspective on data mining)

UNIT - II : Classification Algorithms

15 hours

Introduction to Classification – Statistical Based Algorithms - distance based algorithms –decision tree based algorithms - neural network based algorithms – rule based algorithms –combining techniques.

UNIT - III : Clustering And Association Techniques

15 hours

Introduction to Clustering – Similarity and Distance Measures – Outliers – HierarchicalAlgorithms - Partition Algorithms – Introduction to Association rules - large item sets -basic algorithms – Generalized association rules- multiple level association rules.

(Beyond the Curriculum :Hybrid clustering methods and fuzzy clustering)

UNIT - IV : Basics Of R Tool

15 hours

Getting and installation of R Tool – R GUI – R Console – Over View of R –R Syntax – Robjects – Functions.

UNIT – V : Data Manipulation and Visualization

15 hours

Saving ,Loading and Editing Data - Over View of R Graphics –Analyzing Data – Probability Distributions – Classification Models.

TEXT BOOKS

1. Margaret,H and Dunham.(2006). Data Mining Introductory and Advanced Topics. Pearson education , London .
2. Arun K.Pujari . Data Mining Techniques.(3rd edition). Universities Press (India) Pvt. Ltd , New Delhi.
3. O’Reilly. R IN A NUT SHELL (2nd edition) .A Desktop Quick Reference by Joseph Adler , Pearson education , London .

REFERENCE BOOKS

1. Jiawei Han., Micheline Kamber Jian Pei.(2011) Data mining Concepts & Techniques . (3nd edition). Academic press , Cambridge.
2. G.K.Gupta , (2014), Introduction to data Mining with Case Studies , (3rd edition) ,PHI Learning Private Ltd , New Delhi.
3. T Larose Daniel , (2015) , Data Mining and Predictive Analytics, (2nd Edition) , John Wiley & Sons Inc , US

BLENDED LEARNING:

UNIT	TOPICS	LINKS
V	Introduction to Data Manipulation and Visualizations	https://www.youtube.com/watch?v=cwIXC27yaZY
V	Data Visualization Tutorial For Beginners	https://www.youtube.com/watch?v=MiiANxRHSv4
V	Saving ,Loading and Editing Data	https://www.youtube.com/watch?v=cwIXC27yaZY
V	R Loading Data and Working With Data Frames	https://www.youtube.com/watch?v=qK1EIUMkhq0

V	Intro to Data Analysis / Visualization with Python	https://www.youtube.com/watch?v=a9UrKTVEeZA
V	Probability Distributions	https://www.youtube.com/watch?v=CfZa1daLjwo
V	Classification Models	https://www.youtube.com/watch?v=8TuRJg76sW8

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	3	1	1	3	3	3	3	1	1	1	2	1
CO2	3	2	3	3	3	3	3	3	3	3	3	1	3	2
CO3	3	3	2	3	2	1	1	2	1	3	2	1	3	2
CO4	2	3	1	1	1	3	3	3	3	3	3	3	1	3
CO5	3	3	2	3	3	3	1	3	2	3	3	2	1	3

(Correlation: 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Model Exam	Once in a semester
4	Assignment (Unit I and Unit II)	Twice in a semester
5	Online Quiz (Unit III and Unit IV)	Twice in a semester

6	Paper Presentation (Unit V)	Once in a semester
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Course designed by: Ms.R.Uma Maheswari	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER : III
COURSE CODE : 23PCS3C09
TITLE OF THE COURSE : CORE:SOFTWARE PROJECT MANAGEMENT
(ENTREPRENEURSHIP)

COURSE OBJECTIVES:

- To enable the students to learn the basic approaches of software project management.
- To understand the concepts on critical path and critical activities.
- To learn the concept of risk management and resource allocation.
- To study about quality control and quality assurance.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	To enable the students to learn about Software projects	K1
CO2	Understand Software configuration management concepts	K2
CO3	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation and learning	K3
CO4	Analyze the impact of Software Quality Assurance	K4
CO5	Analyze and Design a real world problem for implementation and understand the Activity Planning and Risk Management.	K5

SYLLABUS

Credits – 4

Instructional hours – 75

UNIT-I : Introduction (K1)**15 hours**

Introduction to Software Projects – Project Evaluation and programme management–
An Overview of Project Planning – Selection of an appropriate Project approach–
Software effort Estimation.

UNIT–II : Activity Planning (K2)**15 hours**

Activity Planning – Project Schedules – Sequencing and Scheduling activities – Network
Planning Models – forward pass- backward pass-Identifying the Critical path-Activity float-
Shortening Project Duration– Identifying Critical Activities – Activity on arrow networks.
(Self Study : Shortening Project Duration)

UNIT-III : Risk Management (K3)**15 hours**

Risk Management – Resource Allocation – Monitoring and Control – Managing People
in software environments –Working in teams.

(Beyond the Curriculum: The Impact of Emotional Intelligence)

UNIT-IV : Software Configuration Management (K4)**15 hours**

Introduction - Basic definitions and terminology - The Process and Activities of software
Configuration Management - Configuration Audit – software configuration management
ingeographically distributed teams – Metrics in software configuration management.
Software quality assurance : How do you define quality - why is quality important in
software - Quality Control and quality assurance – cost and benefits of quality.

(Self Study : Quality Control and quality assurance)

UNIT – V : Engineering Activities (K5)**15 hours**

Project management in testing phase - Project management in maintenance phase.
Emerging trends: Globalization issues in project management - impact of internet on
project management.

TEXT BOOK:

1. Mike Cotterell, Bob Hughes, (2009) , Software Project Management , (fifth edition)
Tata Mcgraw Hill Publishing Company, Uttar Pradesh .

REFERENCE BOOKS

1. Gopalswamy Ramesh , (2006) , Managing Global Software Projects , (first reprint) , Tata McGraw Hill Publishing Company, Uttar Pradesh.
- 2 . Darrel Ince, H.Sharp and M.Woodman, (1995) , Introduction to Software Project Management and Quality Assurance, Tata Mc Graw Hill, Uttar Pradesh.
2. Kim Heldman , (2018) , Project Management – Jump Start, (4th Edition) Wiley Publications , New jersey.

BLENDED LEARNING:

UNIT	TOPICS	LINKS
V	Project management in testing phase	https://www.youtube.com/watch?v=sLgdRO5IS9U
V	Project management in maintenance phase	https://www.youtube.com/watch?v=X2Q_0SG0_WE
V	Globalization issues in project management	https://www.youtube.com/watch?v=JJ0nFD19eT8
V	impact of internet on project management	https://www.youtube.com/watch?v=0tGAXWjZ8JM

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1	2	1	1	2	2	3	1	2	1	2	1
CO2	3	2	1	1	3	3	1	2	1	2	3	1	1	2
CO3	1	3	1	2	1	2	2	1	1	1	3	3	3	1

CO4	1	2	1	2	2	1	3	2	1	2	1	2	2	1
CO5	3	1	3	2	1	1	1	1	3	1	1	3	1	3

(Correlation: 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Model Exam	Once in a semester
5	Assignment (Unit I and Unit II)	Twice in a semester
6	Seminar (Unit IV and Unit V)	Twice in a semester
7	Report Writing (Unit III)	Once in a semester

Course designed by: Ms.M.LincyJacqueline	VerifiedbyHOD: Ms.R.UmaMaheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER : III
COURSE CODE: 23PCS3E01
TITLE OF THE COURSE : ELECTIVE-ARTIFICIAL INTELLIGENCE
(SKILL DEVELOPMENT)

COURSE OBJECTIVES:

- To enable the students to gain basic knowledge about artificial intelligence.
- To introduce the basics of prolog programming language and execute AI problems using the same.

Dr.R.Kavitha

Dr.N.A.Sheela Selvakumari

Dr.R.Vijayabanu

Ms.R.Janane Priya

Mrs.S.Esther Darthi

- To train the students to the various heuristic search techniques and expert systems.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Demonstrate AI problems and techniques	K1
CO2	Understand machine learning concepts	K2
CO3	Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning	K3
CO4	Analyze the impact of machine learning on applications	K4
CO5	Analyze and design a real world problem for implementation and understand the dynamic behavior of a system	K5

SYLLABUS

Credits– 5

Instructional hours –75

UNIT I : Introduction To Artificial Intelligence (K1)

15 hours

What is artificial intelligence, Foundation of AI, History of AI agents, Applications of AI, AI representation, Future of AI, Issues in design of search programs-Blind search or Depth first search, Breadth first search, Logic Programming.

UNIT II : Introduction to Prolog (K2)

15 hours

Introduction to Logic Programming by Prolog, Writing a Prolog Program, Structure of Prolog Program, Types, Search, Backtracking in Prolog, Lists.

UNIT III : Heuristics Search Techniques - I (K3)

15 hours

Heuristics Search, Heuristics Search Methods-Generate and Test, Hill Climbing, Steepest descent Hill Climbing, Simulated Annealing.

(Self study – Simulated Annealing)

UNIT IV: Heuristics Search Techniques - II (K4)**15 hours**

Heuristic Search Methods - Best first Search, The A* Algorithm, And –Or Graphs, The

AO* Algorithm, Means-end Analysis, Constraint Satisfaction.

UNIT V : Expert Systems (K5)**15 hours**

Utilization and Functionality, Architecture of Expert System, Steps to build Expert Systems.

TEXTBOOKS

1. Neeta Deshpande(2008), Artificial Intelligence, Technical Publications , Pune .
2. V.S.Janakiraman , K.Sarukesi and P.Gopalakrishnan(2007), Foundations of Artificial Intelligence and Expert Systems, Trinity Press , New Delhi

REFERENCE BOOKS

1. Elaine Rich and Kavin Knight,(2003), Artificial Intelligence, Second Edition, TataMc Graw–Hill , New Delhi.
2. Ela Kumar,(2008), Artificial Intelligence, I.K. International Publishing House Pvt. Ltd., New Delhi.
3. Gupta.I, Nagpal.G (2017) Artificial Intelligence and Expert (1 st Edition), laxmi Publications Pvt Ltd, India.

BLENDED LEARNING

UNIT	TOPICS	LINKS
V	Utilization and Functionality	https://youtu.be/11nznKn9D8
V	Architecture of Expert System	https://youtu.be/NmF-VJ2NrT0
V	Steps to build Expert System	https://youtu.be/RT-EspnmuSQ

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

CO1	3	3	3	3	3	3	3	3	3	3	1	2	3	3	3
CO2	3	2	3	1	2	3	3	3	3	3	3	3	1	1	2
CO3	1	3	3	3	3	3	3	1	1	1	1	3	3	3	1
CO4	3	3	3	3	1	1	3	2	1	3	3	3	3	2	1
CO5	3	1	3	3	1	1	3	3	3	3	3	3	3	1	3

(Correlation: 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Model Exam	Once in a semester
5	Assignment (Unit I and Unit II)	Twice in a semester
6	Seminar (Unit III and Unit IV)	Twice in a semester
7	Presentation of Paper in Conference (Unit V)	Once in a semester

Course designed by: Ms.C.Clement Sherlin	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER : III
COURSE CODE:23PCS3E02
TITLE OF THE COURSE : ELECTIVE:E-TECHNOLOGIES
(SKILL DEVELOPMENT)

COURSE OBJECTIVES:

- To have an understanding of the Basics of E-Commerce and Technology infrastructure Required for implementing the same.
- To have a knowledge on various methods and strategies for selling on the web.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Demonstrate the knowledge on fundamental concepts of E-Commerce and infrastructure required for the same	K2
CO2	Elucidate on various methods and strategies followed for selling on the web.	K3
CO3	Explain about web server software and its functions	K2
CO4	Enumerate various E-Marketing strategies	K4
CO5	Explain about E-Business Strategy	K4

SYLLABUS

Credits – 5

Instructional hours – 75

UNIT I: Introduction (K2)

15 Hours

Introduction to Electronic Commerce: Electronic Commerce–Business Models, Revenue Models, and Business Processes – Economic Forces and Electronic Commerce – Identifying Electronic Commerce Opportunities – International Nature of Electronic Commerce. Technology Infrastructure: The Internet and the World Wide Web– Internet and World Wide Web – Packet – Switched Networks – Internet Protocols – Markup Languages and the Web – Intranets and Extranets – Internet Connection Options Internet2 and The Semantic Web. The Environment of Electronic Commerce: Legal, Ethical and Tax issues.

UNIT II : Selling on the Web (K3)**15 Hours**

Selling on the Web: Revenue Models and Building a Web Presence – Marketing on the Web - Business – to – Business Strategies: From Electronic Data Interchange to Electronic Commerce – Online Auctions, Virtual Communities and Web Protocols: – Auction Overview – Online Auctions and Related Business – Virtual Communities and Web Portals.

UNIT III : Web Server Hardware and Software (K2)**15 Hours**

Web Server Hardware and Software: – Software for Web Servers – Electronic Mail (E-Mail) – Web Site and Internet Utility Programs – Web Server Hardware. Electronic Commerce Software: Basic Functions of Electronic Commerce Software – Advanced Functions of Electronic Commerce Software – Electronic Commerce Software for Small and Midsize Companies – Electronic Commerce Software for Midsize to Large Businesses – Electronic Commerce for Large Businesses.

UNIT IV : E-Marketing (K4)**15 Hours**

E- Marketing : Traditional Marketing – Identifying Web Presence Goals – The Browsing Behavior Model – Online Marketing – E-Advertising - Internet Marketing Trends – Target Markets – E-Branding – Marketing Strategies. - E-security – E-Payment Systems

UNIT V : E-Strategy**(K4) 15 Hours**

E-Strategy: Information and Strategy – The Virtual Value Chain – Seven Dimensions of E-Commerce Strategy – Value Chain and E-Strategy – Planning the E-Commerce Project – E – Commerce Strategy and Knowledge Management – E-Business Strategy and Data Warehousing and Data mining.

(Self Study: Planning the E-Commerce Project)

TEXTBOOK

1. Gary P. Schneider, (2002), E-Commerce Strategy, Technology and Implementation, Cengage Learning INDIA Private Limited, Boston.

REFERENCE BOOKS

1. P.T. Joseph, (1994) , E-Commerce an Indian Perspective , (Third Edition) , Prentice Hall of India, New Delhi.
2. Mike Papazologn, (2008), E-Business, Organizational and Technical Foundations,Wiley India Pvt Ltd, Bangalore.
3. Elias M. Awad, (2008) , Electronic Commerce, Electronic Commerce, Prentice-Hall of India, New Delhi.

BLENDDED LEARNING

UNIT	TOPICS	LIN KS
V	Information and Strategy	https://www.youtube.com/watch?v=Ck-MR2jFGCc
V	The Virtual Value Chain	https://www.youtube.com/watch?v=g8p2H7EvoGM
V	Seven Dimensions of E-Commerce Strategy	https://www.youtube.com/watch?v=CgnoVYBPb3w
V	Planning the E-Commerce Project	https://www.youtube.com/watch?v=BtAvlWrvtk
V	E – Commerce Strategy and Knowledge Management	https://www.youtube.com/watch?v=C04NAM3pyfk
V	E-Business Strategy and Data Warehousing and Data mining.	https://www.youtube.com/watch?v=7OhCM3awQt0

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	2	1	3	2	1	2	1	3	1	2	1	2	1
CO2	3	2	3	1	1	3	2	2	1	2	1	1	2	2
CO3	2	3	1	1	1	2	1	1	2	1	3	3	3	1

CO4	2	3	1	2	1	1	1	2	1	1	1	2	2	1
CO5	3	2	1	3	1	1	2	1	3	1	1	3	2	3

(Correlation: 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Model Exam	Once in a semester
5	Assignment (Unit I and Unit II)	Twice in a semester
6	Seminar (Unit III and Unit IV)	Twice in a semester
7	Paper Representation (Unit V)	Once in a Semester

Course designed by: Ms.M.Lincy Jacqueline	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER: III

COURSE CODE: 23PCS3CP5

**TITLE OF THE COURSE : CORE LAB: PROGRAMMING WITH R
(EMPLOYABILITY)**

COURSE OBJECTIVE:

- On successful completion of this course the students should have the

Dr.R.Kavitha Dr.N.A.Sheela Selvakumari Dr.R.Vijayabanu Ms.R.Janane Priya Mrs.S.Esther Darthi

knowledge about the concepts of R Tool

COURSE OUTCOME:

At the end of the practical's student can able to

CO1	Interpret the basic manipulation of R Language	K3
CO2	Implement various graphical representation	K3
CO3	RECORD: Transfer the algorithmic work to program and the output of the program in the record presentation	K3

Credits - 4

Instructional hours - 75

LIST OF PRACTICALS

1. Vector Manipulation.
2. Matrix Manipulation.
3. Regular expression and String Manipulation.
4. Function with R.
5. Exploring data with tables.
6. Data Frames.
7. Data processing and optimizing with a function.
8. Import datasets and remove duplicate records and merge the dataset into a single frame.
9. Create a scatter plot for a dataset and customize it.
10. Create a histogram for a particular data set.

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	3	1	1	3	1	1	3	3	1	3	1	3
CO2	3	1	2	2	1	3	1	3	1	3	3	1	2	3

CO3	2	2	2	2	3	3	3	1	3	3	1	1	2	3
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(Correlation: 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
3	CIA II	Once in a semester
4	Record	Once in a semester

Course designed by: Ms.S.Maria Sylviaa	Verified by HOD Ms.R.UmaMaheswari
Checked by CDC Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER:III

COURSE CODE: 23PCS3CP6

TITLE OF THE COURSE : CORE LAB: DIGITAL IMAGE PROCESSING LAB

(EMPLOYABILITY)

COURSE OBJECTIVES:

- To gain programming skills in MATLAB.
- To inculcate knowledge about processing the images.

COURSE OUTCOME:

- At the end of the practical's student can able to

CO1	Apply different filtering techniques and compute mean, Standard Deviation and correlation coefficient of an image	K3
CO2	Implement smoothing, sharpening, transformation and edge detection of an image	K3
CO3	Record : Implement programs and present result	K3

Credits – 4

Instructional hours - 75

LIST OF PROGRAMS

1. Non-Linear Filtering technique using edge detection
2. Computation of mean, Standard Deviation, Correlation coefficient of the given Image
3. Image Smoothing and Sharpening.
4. Edge Detection using Sobel, Prewitt and Roberts Operators.
5. Discretize an image using Fourier transformation
6. Vision program to convert a 2D array into a color image.
7. Morphological Operations on Binary Images.
8. Convert color images into an array of numbers.
9. Discrete wavelet transform on image
10. Image sharpening filters and Edge Detection using Gradient Filters

MAPPING OF CO'S WITH POs AND PEOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	1	2	2	3	2	1	1	1	1	1	1	2
CO2	3	3	2	1	2	1	1	1	1	1	2	1	3	1
CO3	3	3	1	3	1	2	2	1	1	1	2	3	3	2

(Correlation: 3-High, 2- Medium, 1-Low)

ASSESSMENT TOOL

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester

2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Record Note	Once in a Semester

Course designed by: S. Maria Sylvania	Verified by HOD: Ms. R. Uma Maheswari
Checked by CDC :Dr.JaculinArockia Selvi.S	Approved by Principal

SEMESTER: IV
COURSE CODE: 23PCS4C10
TITLE OF THE COURSE : CORE: BIG DATA ANALYTICS
(EMPLOYABILITY)

COURSE OBJECTIVES

- To impart the knowledge of Big Data fundamentals in Business Context
- To inculcate the importance of handling Big Data using various technologies.

COURSE OUTCOMES:

At the end of the course the students will be able to:

CO1	Understand the Big Data fundamentals in Business field.	K2
CO2	Demonstrate the technologies help in processing Big Data.	K3
CO3	Illustrate the technical foundations need to manage Big Data.	K2
CO4	Relate the Query interfaces associated with Big Data.	K3
CO5	Summarize the approaches and tools that supports in analyzing the data.	K2

SYLLABUS

Credits -4

Instructional Hours - 75

UNIT- I : Overview of Big Data in Business Context

15

hoursBig Data – History of Data Management–Evolution of Big Data – Structuring Big

Dr.R.Kavitha Dr.N.A.Sheela Selvakumari Dr.R.Vijayabanu Ms.R.Janane Priya Mrs.S.Esther Darthi

Data – Elements of Big Data - -Big Data Analytics-Use of Big Data in Social Networking
– Use of Big Data in Preventing Fraudulent Activities – Use of Big Data in Detecting
Fraudulent Activities in Insurance Sector.

UNIT – II : Basic Technologies for handling Big Data **15 hours**

Distributed and Parallel Computing for Big Data – Introducing Hadoop - Understanding
Hadoop Ecosystem.-The Map Reduce Framework – Techniques to Optimize Map Reduce
Jobs –Uses of Map Reduce – Characteristics of HBase.

(Self Study: The Map Reduce framework – HBase role in processing Big Data)

UNIT – III: Understanding Big Data technology foundation **15 hours**

Exploring the Big Data Stack – Virtualization and Big Data – Virtualization Approaches -
Processing Your Data with Map Reduce.

(Beyond the Curriculum: Chaining MapReduce Jobs)

UNIT – IV: Exploring technologies used in Big Data **15 hours**

Customizing Map Reduce Execution and Implementing Map Reduce Program - Exploring
Hive – No SQL Data Management.

UNIT –V: Analytical Approaches and Tools (K2) **15 hours**

Comparing , Reporting and Analysis – Types of Analytics – Points to Consider During
Analysis-Analytical Approaches – History of Analytical Tools –Data Visualization Tools.

TEXT BOOKS:

1. Mr. Chaudhari. (2016). BigData- Black Book. Dream tech press , New Delhi.
2. Tom White.,(2015), O’Reilly. Hadoop: The Definitive Guide Map Reduce for the Cloud
(3rd Edition) , California .

REFERENCE BOOKS:

1. Anil Maheswari. (2010) , Data Analytics. McGraw-Hill Education. Uttar Pradesh.
2. Chris Eaton., DirkDeroos., Tom Deutsch., George Lapis Paul Zikopoulos. (2015) ,
Understanding Big Data. Mc Graw hill Education , Uttar Pradesh.
3. Seema Acharya., Subhashini Chellappan , (2010) , Big Data and Analytics. Wiley

Publications , Bangalore.

BLENDDED LEARNING

UNIT	TOPIC	LINKS
V	Comparing , Reporting and Analysis	https://www.slideshare.net/AbhijithRamalingaiah/report-vs-analysis
V	Types of Analytics	https://www.captetchu.edu/blog/five-types-of-big-data-business-analytics
V	Analytical Approaches	https://www.dummies.com/programming/big-data/different-approaches-to-big-data-analysis/
V	Data Visualization Tools	https://medium.com/xnewdata/data-visualization-tools-for-big-data-d728e0110a2d

MAPPING OF CO'S WITH POs AND PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	3	1	2	1	3	3	3	3	3	3	3	3
CO2	2	1	3	3	3	3	3	3	3	3	1	1	1	2
CO3	3	3	3	3	3	1	1	2	3	3	3	3	3	3
CO4	2	3	3	3	3	3	3	3	1	1	2	3	3	3
CO5	2	2	3	3	3	1	1	3	3	3	3	3	3	3

(Correlation: 3-High, 2- Medium,

1-Low)ASSESMET TOOLS

S.NO	Assessment Methods	Frequency Of Assessment
1	End Semester Examination	Once in a semester
2	CIA I	Once in a semester
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4	Model Exam	Once in a semester
5	Assignment (Unit I and Unit II)	Twice in a semester
6	Seminar (Unit III and Unit IV)	Twice in a semester
7	Paper Representation (Unit V)	Once in a Semester

Course designed by: Ms.M.Lincy Jacqueline	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin Arockia Selvi.S	Approved by Principal

SEMESTER: IV

SUBJECT CODE: 23PCS1C11

TITLE OF THE COURSE :CORE:CLOUD COMPUTING

(ENTREPRENEURSHIP)

COURSE OBJECTIVES:

- To learn about cloud architecture and its uses of cloud services.
- To inculcate the use of cloud applications and cloud security & its management.

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1	Discuss about cloud concepts with its features and real time examples.	K2
CO2	Illustrate the cloud Applications in different fields with relevant techniques and web portal, APP Engine used in real world.	K2
CO3	Discuss the cloud architecture to know the work flow of it services using relevant applications.	K2
CO4	Analyze cloud virtualization environment along with its management and cloud security.	K4
CO5	Illustrate the impact of market based management of clouds using deployment and management of multiple external and internal cloud computing services to match business needs.	K2

SYLLABUS

Credits – 4

Instructional Hours - 75

UNIT – I : Cloud Computing and its Applications

15 hours

Cloud Computing - Historical Development - Cloud Computing Environments-Computing Platforms and Technologies. Cloud Services Requirements - Cloud and Dynamic

Dr.R.Kavitha

Dr.N.A.Sheela Selvakumari

Dr.R.Vijayabanu

Ms.R.Janane Priya

Mrs.S.Esther Darthi

Infrastructure- Cloud Computing Characteristics. ECG Analysis in the Cloud-Protein Structure Prediction- Gene Expression Data Analysis - Satellite Image Processing– CRM and ERP - Social Networking.

UNIT-II : Architecture and Solutions to Cloud **15**

hoursCloud Reference Model - Types of Clouds - Cloud Interoperability & Standards - Scalability and Fault Tolerance. Cloud Ecosystem - Cloud Business Process Management Cloud Service Management - Cloud Analytics - Testing Under Control - Virtual Desktop Infrastructure.

UNIT – III : Managing Cloud and Virtualization **15 hours**

Resiliency – Provisioning - Asset management - Concepts of Map reduce - Cloud Governance - High Availability and Disaster Recovery – Virtualization - VirtualizationBenefits - Server Virtualization- Hypervisor Management Software- InfrastructureRequirements – Storage Virtualization - Storage Area Networks – Network-AttachedStorage – Cloud Server Virtualization – Networking Essential to the Cloud .

(Self Study: Asset management- Storage Area Networks)

UNIT-IV : Cloud Security **15 hours**

Cloud Information Security - Cloud Security Services - Design Principles - Secure Cloud Software Requirements - Policy Implementation - Cloud Computing Security Challenges -Cloud Computing Security Architecture.

(Beyond The Curriculum : Green cloud Computing)

UNIT-V : Advanced Cloud Computing **15 hours**

Characterization of Federated Clouds - Definition - Cloud Federation Stack - Third Party Cloud Services - Google App Engine - Microsoft Azure – Amazon Web Services.

TEXT BOOKS

1. Rajkumar Buyya., Christian Vecchiola., Thamarai Selvi S. (2013).Mastering Cloud Computing.(Reprint 2017).Mc Graw Hill Education Publications.
2. Dr.Kumar Saurabh. (2014). Cloud Computing – Unleashing Next Gen Infrastructure to Application.(3rd Edition). Wiley Publications.
3. Ronald L. Krutz., Russell Dean Vines. (2016). Cloud Security – A Comprehensive Guide to

Secure Cloud Computing. Wiley Publications.

REFERENCE BOOKS

1. Anthony T. Velte., Toby J Velte., Robert Elsenpeter. (2010), Cloud Computing- A Practical Approach. TMH Publications.
2. Sosinsky. (2011). Cloud Computing-Bible. Wiley Publications.

BLENDED LEARNING

UNIT	TOPICS	LINKS
V	Characterization of Federated Clouds	https://youtu.be/RRg3tUh_Z0
V	Cloud Federation Stack	https://youtu.be/KAYZq-o9YdE
V	Third Party Cloud Services	https://youtu.be/watch?v=HP5ulKqHTQs&feature=share
V	Google App Engine	https://youtu.be/JSsZQj9WuGM
V	Microsoft Azure	https://youtu.be/Pt9LeIj0fL0
V	Amazon Web Services.	https://youtu.be/wWeyzYzd17o

MAPPING OF CO'S WITH POs / PSOs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	1	1	1	1	2	2	3	2	3	1	2
CO2	3	3	1	1	1	1	2	1	1	1	3	2	2	2
CO3	3	3	3	2	1	1	1	1	2	1	2	3	1	3
CO4	2	3	3	1	2	3	2	3	2	3	2	3	2	1
CO5	2	3	3	3	2	2	3	2	2	3	1	3	1	3

(Correlation: 3-High, 2- Medium,

1-Low) ASSESSMENT TOOLS

S.No	Assessment Methods	Frequency of Assessment
1	End Semester Examination	Once in a Semester
2	CIA I	Once in a Semester
3	CIA II	Once in a Semester
4	Model Exam	Once in a Semester
5	Assignment (Unit I and Unit II)	Twice in a Semester
6	Seminar (Unit III and Unit IV)	Twice in a Semester
7	Paper Presentation in Seminar or Conference (Unit V)	Once in a Semester

Course designed by: Ms.R.Usha Devi	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin ArockiaSelvi.S	Approved by Principal

SEMESTER : IV
COURSE CODE: 23PCS4PVV
PROJECT AND VIVA VOCE

Credits - 7
COURSE OBJECTIVES

To provide efficient solutions in challenging real world application areas.

- To Enhance the knowledge in Research methodologies

Course designed by: Ms.R.Uma Maheswari	Verified by HOD: Ms.R.Uma Maheswari
Checked by CDC: Dr.Jaculin ArockiaSelvi.S	Approved by Principal

POST GRADUATE PROGRAMME – M.Sc. COMPUTER SCIENCE

CHOICE BASED CREDIT SYSTEM (CBCS PATTERN)

(FOR THE CANDIDATES ADMITTED FROM THE ACADEMIC YEAR 2023 - 24 ONWARDS)

SEMESTER & (PART)	COURSE CODE	TITLE OF THE COURSE	NATURE	IH	CP	EXAM HOURS	EXAM MARKS		
							CIA	ESE	TOTAL
I SEM	23PCS1C01	CORE : PRINCIPLES OF COMPILER DESIGN	CC	5	4	3	25	75	100
	23PCS1C02	CORE : ANALYSIS AND DESIGN OF ALGORITHMS	CC	5	4	3	25	75	100
	23PCS1C03	CORE : ADVANCED JAVA PROGRAMMING (Employability)	CC	5	4	3	25	75	100
	23PCS1E01 / 23PCS1E02	ELECTIVE : PARALLEL PROCESSING/ NEURAL NETWORKS AND GENETICS ALGORITHM (Skill Development)	DSE	5	5	3	25	75	100

	23PCS1CP1	CORE PRACTICAL : ADVANCED JAVA PROGRAMMING (Employability)	CC	5	4	3	40	60	100
	23PCS1CP2	CORE PRACTICAL : ANALYSIS AND DESIGN OF ALGORITHMS	CC	5	4	3	40	60	100
II SEMESTER	23PCS2C04	CORE:DATA COMMUNICATION AND NETWORKS (Skill Development)	CC	5	4	3	25	75	100
	23PCS2C05	CORE : ADVANCED OPERATING SYSTEMS (Skill Development)	CC	5	4	3	25	75	100

	23PCS2C06	CORE : ADVANCED PYTHON PROGRAMMING (Employability)	CC	5	4	3	25	75	100
	23PCS2E01/ 23PCS2E02	ELECTIVE : MACHINE LEARNING / SOFT COMPUTING (Employability)	DSE	5	5	3	25	75	100
	23PCS2CP3	CORE PRACTICAL : ADVANCED PYTHON PROGRAMMING (Employability)	DSE	5	4	3	40	60	100
	23PCS2CP4	CORE PRACTICAL : LINUX PROGRAMMING (Employability)	CC	5	4	3	40	60	100
III SEMESTER	23PCS3C07	CORE: DIGITAL IMAGE PROCESSING (Employability)	CC	5	4	3	25	75	100
	23PCS3C08	CORE : DATA MINING WITH R (Employability)	CC	5	4	3	25	75	100
	23PCS3C09	CORE : SOFTWARE PROJECT MANAGEMENT (Entrepreneurship)	CC	5	4	3	25	75	100
	23PCS3E01 / 23PCS3E02	ELECTIVE : ARTIFICIAL INTELLIGENCE/ E – TECHNOLOGIES (Skill Development)	DSE	5	5	3	25	75	100
	23PCS3CP5	CORE PRACTICAL : PROGRAMMING WITH R (Employability)	CC	5	4	3	40	60	100
	23PCS3CP6	CORE PRACTICAL : DIGITAL IMAGE PROCESSING (Employability)	CC	5	4	3	40	60	100
IV SEMESTER	23PCS4C10	CORE : BIG DATA ANALYTICS (Employability)	CC	5	4	3	25	75	100
	23PCS4C11	CORE : CLOUD COMPUTING (Entrepreneurship)	CC	5	4	3	25	75	100
	23PCS4PVV	PROJECT AND VIVAVOCE	CC	20	7	3	100	100	200

TOTAL					90				2200
		DIGITAL SECURITY		2	2	3	-	50	50
		Swayam & MOOC Course		-	2	-	-	-	-
GRAND TOTAL		TOTAL		120+ 2	90 + 2 + 2	--	--	--	2250

IH –Instructional Hours, CP-Credit Points ,CIA -Continuous Internal assessment ESE-End Semester Examination

ABBREVIATIONS	NATURE OF COURSE
CC	CORE
DSE	DISCIPLINE SPECIFIC ELECTIVE